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NOTES ON GEOGRAPHIC DISTRIBUTION

Pisces, Perciformes, Gobiidae, *Evorthodus lyricus* (Girard, 1858): New record from Patos-Mirim Lagoon System, state of Rio Grande do Sul, southern Brazil

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ABSTRACT: The present note records for the first time the tropical gobiid fish *Evorthodus lyricus* (Girard, 1858) from Patos-Mirim Lagoon System, state of Rio Grande do Sul, southern Brazil. Considering the known distribution of the species, and unpublished data obtained from fish collections, the present record widens the distribution of *E. lyricus* in 300 km southwards, and is the first occurrence of the species for freshwater conditions in southern Brazil.

Six of the 40 gobiid species recorded in Brazil (Menezes *et al.* 2003) have been reported in the Patos-Mirim Lagoon System in the southern part of the country. *Bathygobius soporator* (Valenciennes, 1837), *Ctenogobius smaragdus* (Valenciennes, 1837), *Ctenogobius stigmaticus* (Poey, 1860), *Ctenogobius shufeldti* (Jordan and Eigenmann, 1887), *Gobionellus oceanicus* (Pallas, 1770), and *Gobiosoma parri* Ginsburg, 1933 (Chao *et al.* 1982; Lucena and Lucena 1982; Sinque and Muelbert 1998; Burns *et al.* 2010). We provide herein the first record of *Evorthodus lyricus* (Girard, 1858) (Figure 1) in Patos-Mirim Lagoon System.

The genus *Evorthodus* was diagnosed by Ginsburg (1931) and Dawson (1967), and according to Pezold (2004) the synapomorphy of the genus is the presence of incisiform teeth in juveniles and females. The genus includes only two species, *E. lyricus* (Girard, 1858) that occurs in western Atlantic coastal and *E. minutus* Meek and Hildebrand, 1928 from Pacific (Dawson 1967; Foster and Fuiman 1987; Froese and Pauly 2010).

The Lyre Goby *Evorthodus lyricus* is classified as "euryhaline marine" species (Gunter 1956), and presents a distribution pattern similar to other peripheral tropical fish species (Foster and Fuiman 1987). The species has already included in listings of threatened fauna of North Carolina (USA) (Lindquist 1988).

On June and July 1992, seventeen individuals of *E. lyricus* were caught in drainage canal of Pontal da Barra swamp (31°47'08" S 52°14'29" W), Laranjal Beach, Pelotas County, Rio Grande do Sul state, southern Brazil (Figure 2A). Specimens were preserved in 70 % alcohol and identified based on Menezes and Figueiredo (1985). Voucher specimens are deposited at Coleção Ictiológica Morevy Cheffe, Grupo Especial de Estudo e Proteção do Ambiente Aquático do Rio Grande do Sul (CIMC 8991, 7, 19.4-38.2 mm SL; CIMC 9048, 5, 13.8-42.7 mm SL) and Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul (MCP 17576, 5, 20.8-30.4 mm SL).

FIGURE 1. *Evorthodus lyricus* (CIMC 9048) captured in Rio Grande do Sul state, Patos-Mirim Lagoon System, southern Brazil.

According to the literature the species was previously recorded from North, Central, and South America in Atlantic coast, from Chesapeake Bay, Florida (USA) to Porto Belo, Santa Catarina, Brazil (Menezes *et al.* 2003), also recorded from Gulf of Mexico and Greater Antilles, absent from Bahamas (Froese and Pauly 2010).

As a complement of our record, we examined material from fish collection of MCP/PUCRS and confirmed the occurrence of *E. lyricus* for Siriú Beach (marine waters), Garopaba, Santa Catarina state (MCP 36906 and MCP 36910) and for Tramandaí Lagoon (brackish or estuarine waters), Imbé, Rio Grande do Sul state (MCP 36903 and MCP 36904) (Figure 2B), all of them south of Porto Belo (the previous southern limit of distribution of *E. lyricus*) (Menezes *et al.* 2003). Considering these records, the present study widens the distribution of *E. lyricus* in 300 km southwards.

The species inhabits muddy areas of bays, mainly estuarine or brackish, also marine, rarely freshwater (Kullander 2003). This occurrence of *E. lyricus* in Pontal da Barra swamp is the first one for freshwater from southern Brazil. In beach of São Gonçalo canal, and drainage canals of Pontal da Barra (Figure 3), the *E. lyricus* frequently occurs in sympatry with two other gobioids species: *Ctenogobius shufeldti* and *Dormitator maculatus* (Bloch, 1792), which was recently recorded for this same area by Volcan *et al.* (2010); for *E. liricus*, constitutes its southernmost

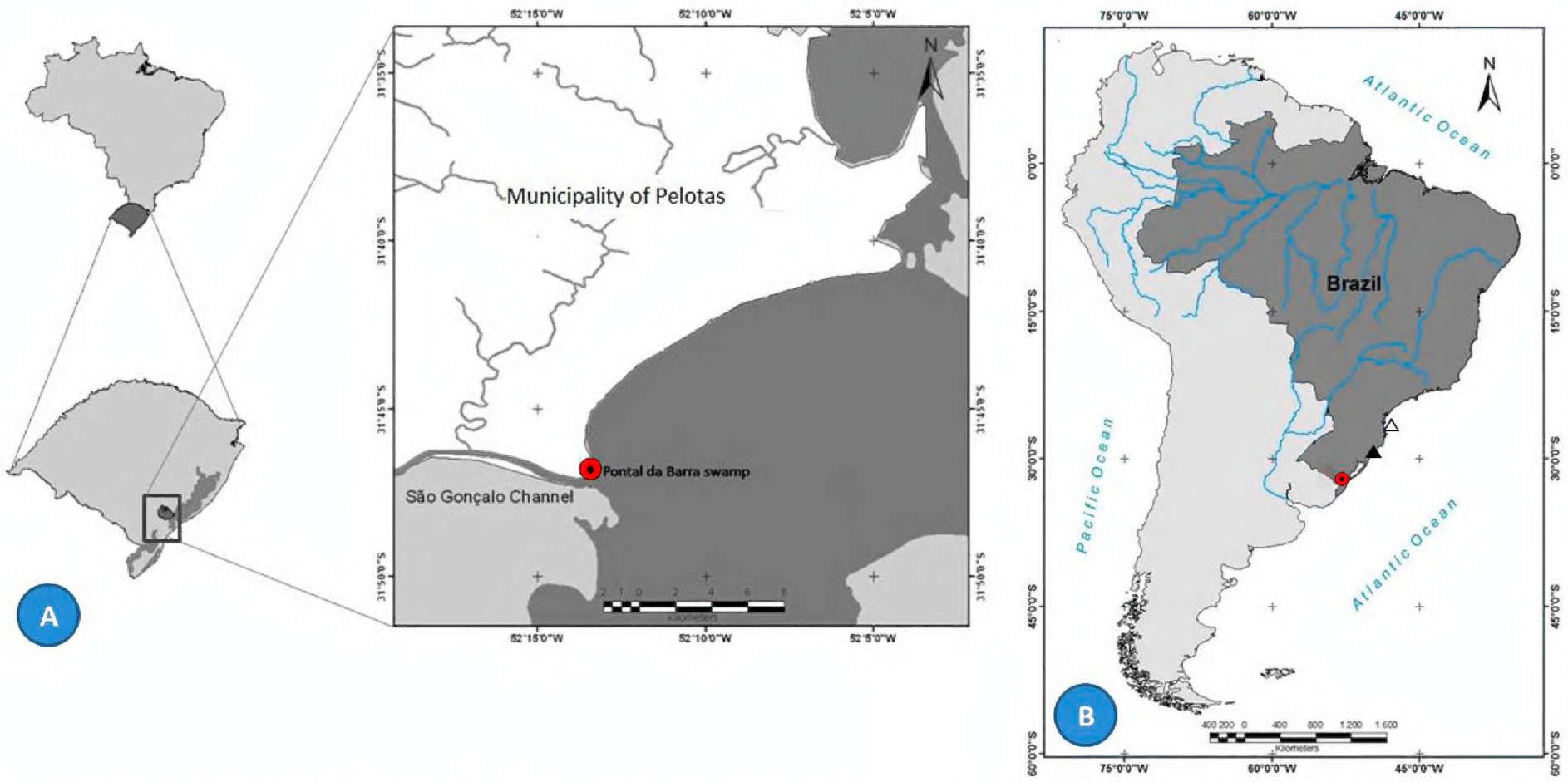

FIGURE 2. (A) Map showing the occurrence of *Evorthodus lyricus* in Patos-Mirim Lagoon System, Rio Grande do Sul state. (B) Unpublished data on the occurrence of *Evorthodus lyricus* in southern Brazil, obtained in the fish collection of the MCP/PUCRS. (△) Siriú Beach, Garopaba, Santa Catarina state (MCP 36906 and MCP 36910). (▲) Tramandaí Lagoon, Imbé, Rio Grande do Sul state (MCP 36903 and MCP 36904). (●) Present record of E. lyricus for Patos-Mirim Lagoon System, Rio Grande do Sul state (CIMC 8991, CIMC 9048 and MCP 17576).

distribution. According to Foster and Fuiman (1987) the distribution of the species is probably related to coastal currents, affecting the dispersal of pelagic larvae. *Evorthodus lyricus* had parental care behavior, and adult males guarded egg masses, and removed physically small-sized predators from the vicinity of the burrow, previously excavated by the male. These authors suggest that the reproduction of the species is related to gradual freshening of the water during rainy seasons.

FIGURE 3. Occurrence site of *Evorthodus lyricus* in Pontal da Barra swamp, Patos-Mirim Laggon System, southern Brazil.

The occurrence of juvenile specimens with approximately 14 mm of SL indicates that *E. lyricus* breed in study area. Probably *E. lyricus* also occurs in other localities of Patos-Mirim Lagoon System, however more studies are needed to determine the actual conservation status of this species in the region.

Possible explanations for sporadic occurrence of *Evorthodus lyricus*, and other gobiid species in the Patos-Mirim Lagoon System include variations of salinity, inappropriate collecting methods, insufficient sampling of appropriate habitat, low abundance, and the cryptic habits of this species (Wyanski and Targett 1985; Foster and Fuiman 1987; Burns *et al.* 2010).

Apparently the occurrence of tropical fish in subtropical waters of the Patos-Mirim Lagoon System is related to the Brazilian Current in the Atlantic coast, which brings warm surface waters from the tropical to the subtropical region (Burns *et al.* 2010). Although anthropogenic factors have influence in fish distributions, the occurrence of other tropical gobioid fishes as *Bathygobius soporator*, *Ctenogobius smaragdus*, *Ctenogobius stigmaticus*, *Gobionellus oceanicus*, *Gobiosoma parri*, and *Dormitator maculatus* in Patos Lagoon, indicates that these species are autochthonous in the region, but are overlooked, and occur at low density in its southern distribution range limits.

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